

```

/*
/*
/* Program: lintro.aml
/* Purpose: Create intro1.map a duplicate of the first map,
/*          intro.aml, created by the present.aml script.
/*          It shows the geographical relationships between the
/*          gwma and the cities surrounding it.
/*
/*
/* Inputs:
/* Outputs: screen output
/*          graphics file
/*
/*
/* History: 8/94 original coding, recoded 9/94 after erasure and
/*          backup recovery failure.
/*
/*
/*
/*
&echo &on
&r offmaps
/*intro.map
/*image.map
/*shorebird.map
/*pblnds.map
/*nddb.map
/*lbgp.map
/*lglu.map
/*flymap.map
/*sph.map
imageview create tifvert size canvas 540 900 position 600 0
imageview create tifhori size canvas 1200 768 position ul
&pause
/* intro.map begins the presentation by locating the geographical
/* relationships between the gwma and the cities surrounding it.
map lintro.map
mape gwmasa
lineset carto.lin
linesym 103
linecolor 3
arcs gwma
LINE 8.8 1.8 9.1 2.3 9.4 1.8 9.7 2.3
TEXTSIZE .3 .3
TEXTSET FONT.TXT

```

```
TEXTSYM 9
MOVE 9.9 2.1
TEXT 'GRASSLAND WILDLIFE'
MOVE 9.9 1.8
TEXT 'MANAGEMENT AREA'
linesym 201
arcs mroads
linesym 102
linecolor 7
arcs muni
textset font.txt
textsym 3
textsize .194 .194
move 5.6 3.4
text 'HWY 152'
textsize .15 .15
move 3.6 4.2
text 'HENRY MILLER ROAD'
textsize .15 .15
move 2.6 8.5
text 'HWY 140'
textsym 21
textsize .3 .3
move 6.95 1.65
text 'Dos Palos'
move 10 8.5
text 'Merced'
move 2.5 2.9
text 'Los Banos'
move 1.7 7.2
text 'Gustine'
lineset carto.lin
linesym 103
/*units map
/*line 727182 4090503 744884.94 4090503
/*text '5 MILES'
map end
```

```
/*  
/*  
/* Program: 2image.aml  
/* Purpose: Display a color enhanced satellite view showing a  
/* regional view of the landscape. Discuss two of the  
/* most important principles of conservation biology:  
/* AVOID FRAGMENTING HABITAT AND KEEP LINKS BETWEEN  
/* HABITAT PATCHES.  
/* Points to be made within the context of Conservation  
/* Biology are A) two major blocks of wetland habitat  
/* exist, one to the north and another to the south.  
/* These areas are identified by the enhanced colors  
/* blue = open water magenta = growing emergent vegetation,  
/* green = turbid water yellow = rice fields. B) There  
/* is a natural corridor between the two areas, to the  
/* east of Los Banos, that provides a landscape linkage  
/* between them. c) This linkage is extremely important,  
/* it connects two areas of high biotic resource, greatly  
/* enhancing both of the biotic potential of each area.  
/*  
/*
```

```
/*  
/* Inputs:  
/* Outputs: screen output  
/* graphics file  
/*  
/*
```

```
/* History: 8/94 original coding, recoded 9/94 after erasure and  
/* backup recovery failure.  
/*  
/*  
/*  
/*
```

```
/*  
mape gwmasa  
image /home/lgwd/temp/t4334/t4334gras.gis  
mape gwmasa  
lineset carto.lin  
linesym 103  
linecolor 3  
arcs gwma  
units page  
linesym 201  
arcs mroads  
linesym 102  
linecolor 7  
arcs muni94lb  
textset font.txt  
textsym 3
```

textsize .194 .194
units page
move 5.6 3.4
text 'HWY 152'
textsize .15 .15
move 3.6 4.2
text 'HENRY MILLER ROAD'
textsize .15 .15
move 2.6 8.5
text 'HWY 140'
textsize .4 .4
textsym 21
move 6.95 1.75
text 'Dos Palos'
move 10 8.5
text 'Merced'
move 2.5 2.9
text 'Los Banos'
move 0.677 6.95
text 'Gustine'
units map
linesym 104
box 720521.55 4088840.828 728568.285 4088840.828
move 721571.787 4086970.478
text '5 MILES'
msel 2 3 4 5 6 7 8 9 10 11 12 13
mdel
linecolor 5
arcs gwd

```
/*  
/*  
/* Program: 3close.aml  
/* Purpose: To bring familiar photographic views of the landscape  
/* into close association with the satellite view by  
/* displaying a closeup of the a color enhanced  
/* satellite view (2image.map) and while toggling  
/* between the satellite view of the area and the  
/* relatively familiar photo views of the area.  
/*
```

```
/*  
/* Notes: Discussion with photos can include:  
/* a) lgwd-p01.tif - the old Pajaro Vista site with the  
/* fish ponds in the lower left next to HWY 152 and the  
/* reservoir below the sewage ponds(not visible) on edge  
/* of Santa Fe Grade.  
/* b) lgwd-p02.tif - the sewage ponds in the background  
/* and the latest development in the foreground. To  
/* the east is more agriculture and wetland area.  
/* c) lgwd-p06.tif - Klamath duck club, northeast  
/* of the sewage ponds (in background), is optimum  
/* waterfowl habitat.  
/* d) lgwd-p10.tif - Open water habitat with emergent  
/* marsh.  
/* e) lgwd-p11.tif - Vast stretches of emergent fresh  
/* water marsh. Segue into multispecies management  
/* requirements (GGS)  
/*
```

```
/*  
/* Inputs:  
/* Outputs: screen output  
/* graphics file  
/*
```

```
/*  
/* History: 8/94 original coding, recoded 9/94 after erasure and  
/* backup recovery failure.  
/*  
/*  
/*
```

```
map close.map  
imageview create tifvert size canvas 540 900 position 600 0  
imageview create tifhori size canvas 1200 750 position ul  
mape 688806.026 4108999.047 699751.038 4100824.923  
image /home/lgwd/temp/t4334/t4334gras.gis  
arcs mroads
```

```
textsize .194 .194
move 5.6 3.4
text 'HWY 152'
textsize .15 .15
move 3.6 4.2
text 'HENRY MILLER ROAD'
textsize .15 .15
imageview lgwd-p01.tif # # tifhori
&tty
imageview lgwd-p02.tif # # tifvert
&tty
imageview lgwd-p06.tif # # tifhori
&tty
imageview lgwd-p10.tif # # tifhori
&tty
imageview lgwd-p11.tif # # tifhori
map end
&tty
```

```

/*
/*
/*  Program: 4shorebird.aml
/*  Purpose: Show relative shorebird diversity of the grassland
/*           area.
/*
/*
/*  Notes:  Two focal areas of high diversity are centered
/*           within each of the two wetland areas.
/*           To the east of Los Banos is a contiguous stretch
/*           of medium diversity linking the two high diversity
/*           patches. To the west are lower diversity areas.
/*
/*
/*  Inputs:
/*  Outputs: screen output
/*           graphics file
/*
/*
/*  History: 8/94 original coding, recoded 9/94 after erasure and
/*           backup recovery failure.
/*
/*&if [exists /home/lgwd/shorebird.map -directory] &then
/*  &do
/*    &sys rm -r /home/lgwd/shorebird.map
/*  &end
/*&else
/*&do
/*&pause
/*&end
/*&pause
mape gwmasa
units page
map shorebird.map
SHADESET CARTO.SHD
polygonsh shorebird div shorebird.lut
textset font.txt
textsym 3
TEXTSIZE .5 .5
MOVE 7.96 7.55
TEXT 'SHOREBIRD DIVERSITY'
textsize .3 .3
KEYAREA 9.93 6.6 12.6 3.84
keyshade shorebird.lut info symbol text nobox
textsize .25 .25
move 9.36 2.55
text 'Raw data provided by'
move 9.36 2.08
text 'Point Reyes Bird Observatory'
map end

```

```

/*
/*  Program: 5mapfly.aml
/*  Purpose: Show area of pintail movement using Joe Fleskes
/*           pintail flight location data
/*
/*
/*
/*
/*  Notes:  Two focal areas of high diversity are centered
/*          within each of the two wetland areas.
/*          To the east of Los Banos is a contiguous stretch
/*          of medium diversity linking the two high diversity
/*          patches. To the west are lower diversity areas.
/*
/*
/*
/*
/*  Inputs:
/*  Outputs: screen output
/*           graphics file
/*
/*
/*
/*  History: 8/94 original coding, recoded 9/94 after erasure and
/*           backup recovery failure.
/*
/*
mape gwma
map 5prnt.map
linecolor 6
arcs gwma
textsize .26 .26
lineset carto.lin
linesym 103
linecolor 7
arcs flyloc
line 10.2 6.1 10.35 6.7 10.5 6.1 10.65 6.7
move 10.8 6.24
text 'Pintail flight movements'
move 10.8 5.9
text 'on 3 hunt days, 1992'
linesym 108
linecolor 5
arcs gwd
line 10.2 3.6 10.35 4.2 10.5 3.6 10.65 4.2
move 10.88 3.75
text 'GRASSLAND WATER'
move 11.42 3.43
text 'DISTRICT'
textsize .215 .215
move 10.88 5.5
text 'personal communication'
move 10.88 5.3

```


text 'Joe Fleskes'
move 10.88 5.1
text 'National Biological Survey'
move 10.88 4.9
text 'Dixon, CA'
arcs public
labeltext public text
map end

```
/*  
/*  
/* Program: 6nddb.aml  
/* Purpose: To show the endangered, threatened and rare species  
/*           that are listed in the Natural Diversity  
/*           Database.  
/*  
/*
```

```
/* Notes:   after the map is drawn, the identify command will  
/*           allow the user to query 4 keymarker points. If you  
/*           pick the point in Los Banos be aware that  
/*           there are numerous old (1931) records at that point.  
/*           The first record that will show is a yellow rail.  
/*  
/*
```

```
/* Inputs:  
/* Outputs: screen output  
/*           graphics file  
/*  
/*
```

```
/* History: coded 9/94  
/*
```

```
&sys rm -r nddb.map  
map nddb.map  
linesym 101  
linecolor 5  
arcs canals  
arcs hyd100k  
linecolor 2  
arcs mroads  
linecolor 7  
arcs muni  
markerset municipal.mrk  
pointmarker nddbshow cname nddbshow.lut  
box 10.113 9.387 13.816 0.62  
textsize .17 .17  
textoffset 0 -.1  
keyarea 10.113 9.387 13.816 0.62  
keymarker nddbshow.lut info symbol cname nobox  
textsize .22 .22  
MOVE 10.175 0.320  
text 'NATURAL DIVERSITY DATABASE 1994'  
map end  
identify nddbshow point *  
identify nddbshow point *  
identify nddbshow point *  
identify nddbshow point *
```

```

/*
/*
/*  Program: 7lbgp.aml
/*  Purpose: To show the planned expansion of Los Banos in light
/*            of the previous information shown in the presentation
/*            script (1present.aml).
/*            The landuse plan of 8/94 is incompatible with the
/*            landuse requirements of the biological resources
/*            of Los Banos. An area of resource beneficial use
/*            and resource neutral use is identified for discussion
/*            purposes (hence not included in the legend).
/*
/*
/*
/*  notes:
/*map
/*
/*
/*
/*
/*  Program: 8biosph.aml
/*  Purpose: To show the spheres of influence for the cities
/*            close to GWMA, and the one and two-mile spheres
/*            of the GWMA.
/*
/*
/*
/*
/*  Inputs:
/*  Outputs: screen output
/*            graphics file
/*
/*
/*
/*  History: 8/94 original coding, recoded 9/94 after erasure and
/*            backup recovery failure.
/*
/*
/*
map biosph.map
map gwmasa
image /home/lgwd/temp/t4334/t4334gras.gis
shadeset color.shd
shadesym 1
units page
patch 10.09 9.5 13.92 0.04
textset font.txt
textsymb 3
textcolor 0
textsize .4 .4
move 10.75 9.01
text "SPHERES OF"

```

MOVE 11 8.56
TEXT "INFLUENCE"
lineset carto.lin
textsym 3
textsize .3 .3
textcolor 0
linesym 202
arcs mroads
linesym 102
linecolor 0
arcs spheres
line 10.6 7 10.75 7.6 10.9 7.0 11.05 7.6
move 11.3 7.3
text "City Spheres"
linesym 103
linecolor 3
arcs gwma
line 10.6 6 10.75 6.6 10.9 6.0 11.05 6.6
move 11.3 6.4
text "Grassland Wildlife"
move 11.3 6.1
text "Management Area"
linecolor 5
arcs gwd
line 10.6 5 10.75 5.6 10.9 5.0 11.05 5.6
move 11.3 5.4
text "Grassland Water"
move 11.6 5.1
text "District"
move 11.3 4.4
text "GWMA 1 mile"
move 11.6 4.1
text "sphere"
linecolor 7
arcs gwmaone
arcs gwmasa
line 10.6 4 10.75 4.6 10.9 4.0 11.05 4.6
line 10.6 3 10.75 3.6 10.9 3.0 11.05 3.6
lineset oilgas.lin
linesym 102
linecolor 9
arcs gwmasa
line 10.6 3 10.75 3.6 10.9 3.0 11.05 3.6
move 11.3 3.4
text "GWMA 2 mile"
move 11.6 3.1
text "sphere"
map end

APPENDIX C. Data Transfer/ GWD Computer Implementation.

Three basic options exist for the transfer and use of the database developed by Thomas Reid Associates.

1. Use existing resources for map viewing and provide data tapes to researchers with ARC/INFO or other GIS system for working with files. This option will allow you to view and print the maps as a graphic file or import them into a graphic program (Aldus FREEHAND, MACPAINT) for further non-geographically referenced manipulation.

Cost: minimal (floppy discs and 2-3 1/4" tape drives @ \$15/tape.)

2. Acquire pc ARCVIEW software from ESRI and a cd-rom and cd-rom drive. This option allows you to view and update the datafiles.

Cost: \$150 CD ROM disc (additional CD ROM's @ \$15 - 55/disc depending on quantity.

\$200-400 CD ROM disc drive

\$995 ARCVIEW for pc

3. Acquire pc ARC/INFO. This option allows you full manipulation of the data.

Cost: \$3500

EXHIBIT 10

C.V. of Dr. Reed Noss

CURRICULUM VITAE

Reed Frederick Noss, Ph.D.

Conservation Biologist
Certified Senior Ecologist, Ecological Society of America
Fellow, American Association for the Advancement of Science

Office:

University of Central Florida
Department of Biology
4000 Central Florida Blvd.
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PHONE: (407) 823-0975
FAX: (407) 823-5769
Email: rnoss@mail.ucf.edu
web page: <http://www.cas.ucf.edu/biology/>

Summary

Primary interests and talents are in conservation biology, biogeography, landscape ecology, vertebrate ecology, vegetation science, land-use planning, nature reserve design, ecosystem management, field ornithology and herpetology, forest and desert ecology, biological inventory and monitoring, natural history, teaching, writing, and editing.

Education includes a B.S. in Biology and Health Education, graduate work in Environmental Education, a M.S. in Ecology (University of Tennessee), and a Ph.D. in Wildlife Ecology (University of Florida).

Employment experience includes field biological research, animal and plant population surveys, conservation and land-use planning, environmental assessment and review, land management, natural history interpretation, supervision, research administration, writing, editing, and teaching. Professional service includes Editor-in-Chief, *Conservation Biology* (1993-1997) and President of the Society for Conservation Biology (1999-2001).

Personal

Born June 23, 1952, Dayton, Ohio (citizen of U.S.A.)
Married, three children
Excellent physical condition

Employment

August 2002-present. **Davis-Shine Professor of Conservation Biology and Provost's Distinguished Research Professor**, University of Central Florida, Department of Biology, Orlando, FL

February 2002 – present. **Chief Scientist**, The Wildlands Project, Richmond, Vermont

August 1990-present. **International Consultant and Lecturer in Conservation Biology**

August 1999-2002. **Chief Scientist**. Conservation Science, Inc. Corvallis, OR, and Chuluota, FL

2000-present. **Adjunct Professor and Courtesy Professor**. Department of Biology, University of Oregon. Eugene, Oregon

1997-present. **Courtesy Professor**, Department of Forest Science, Oregon State University, Corvallis, Oregon

1994-present. **Courtesy Associate Professor**, Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon

1989-present. **Adjunct Professor**, The Union Institute, University of Cincinnati, Cincinnati, Ohio

August 1997-August 1999. **Chief Scientist**, The Conservation Biology Institute. Corvallis, Oregon

1993-1997. **Editor**, *Conservation Biology*. Society for Conservation Biology. Oregon State University, Department of Fisheries and Wildlife, Corvallis, Oregon

1991-1997. **Research Associate**, Stanford University, Center for Conservation Biology

1991-1996. **Research Scientist**, University of Idaho, College of Forestry (half-time appointment, National Biological Service; on leave Sept. 1993-May 1996 as a Pew Scholar in Conservation)

1992-1996. **Science Director**, The Wildlands Project (supported by Pew Scholars Award in Conservation and the Environment)

1989-1994. **Courtesy Assistant Professor**, Department of Fisheries and Wildlife, Oregon State University

1988-1990. **Biodiversity Project Leader**, U.S. Environmental Protection Agency, Environmental Research Lab, Corvallis, Oregon

1984-1988. **President and Ecologist**, Landscape Ecosystems (consulting firm), Gainesville, Florida

1987-1988. **Staff Ecologist**, KBN Engineering & Applied Sciences, Inc., Gainesville, Florida

1988. **Adjunct Faculty**, Santa Fe Community College, Gainesville, Florida (Biology Instructor)

1987. **Associate Faculty**, School for Field Studies, Beverly, Massachusetts (taught field ecology course in San Juan Mountains of Colorado)

1984-1987. **Graduate Research Assistant**, University of Florida, Gainesville, FL

1983-1984. **Managed Area Specialist**, Florida Natural Areas Inventory, The Nature Conservancy, Tallahassee, FL

1981-1983. **Ecologist**, Ohio Natural Heritage Program, Ohio Dept. of Natural Resources, Division of Natural Areas & Preserves, Columbus, Ohio

1980-1981. **Naturalist**, Ohio Dept. of Natural Resources, Div. of Parks & Recreation

1979. **Field Biologist**; contracts included: (1) survey of herpetofauna in proposed state natural areas for Tennessee Natural Heritage Program; (2) survey of gray bat maternity colonies in Kentucky for U.S. Fish & Wildlife Service

1977-1979. **Graduate Teaching Assistant**, University of Tennessee (Knoxville); taught General Biology and General Ecology

1978. **Ecological Consultant in Nicaragua**. Land-use and national park planning

1972-1977. **Environmental Education**, several jobs: (1) Science Director for youth camp in Ontario (3 summers); (2) Teacher-naturalist at Glen Helen Outdoor Education Center, Antioch College (1 year); (3) Naturalist for youth camp in Ohio (1 summer); (4) Naturalist for Ohio Historical Society at Cedar Bog State Preserve (2.5 years, part-time)

Education

1975. B.S. School of Education, University of Dayton, Ohio. Final GPA = 3.78

1975-1976. Graduate School of Education, Antioch College, Yellow Springs, Ohio. 15 graduate hours in outdoor education

1979. M.S. Graduate Program in Ecology, University of Tennessee, Knoxville. Cumulative GPA = 3.96

1988. Ph.D. Department of Wildlife & Range Sciences, School of Forest Resources & Conservation, University of Florida. Cumulative GPA = 4.00

Honors and Awards

1984-1987. Graduate Research Award, School of Forest Resources and Conservation, University of Florida

1985. Annual Research Award, Florida Ornithological Society

1986. Annual Research Award, Alachua Audubon Society

1986. Annual Research Award, Frank M. Chapman Memorial Fund, American Museum of Natural History

1986. Annual Research Award, Josselyn Van Tyne Memorial Fund, American Ornithologists' Union

1987. President's Recognition Award, University of Florida

1988. Environmental Publication Award, National Wildlife Federation

1993-1996. Pew Scholars Fellowship in Conservation and the Environment

1995. Conservation Community Award for Outstanding Achievement in the Field of Publications, Natural Resources Council of America (for Noss and Cooperrider, *Saving Nature's Legacy*)

1995. Edward T. LaRoe III Memorial Award of the Society for Conservation Biology. This is the highest award of the Society, given for outstanding achievement in translating the principles of conservation biology to policy and management

1999. Elected Scientific Fellow, Wildlife Conservation Society

2001. Certified Senior Ecologist, Ecological Society of America

2001. Elected Fellow, American Association for the Advancement of Science

2002. Wildlife Publications Award, Outstanding Edited Book Category, The Wildlife Society (for Mæhr, Noss, and Larkin, *Large Mammal Restoration*)

Avocations

Karate (6th degree black belt and master instructor, Hayashi-ha Shito-ryu), kobudo (ancient Okinawan weaponry, 3rd degree black belt), tai chi chu'an, hatha yoga, archery, birding, natural history, hiking and backpacking, canoeing, nature photography, music

Professional Society Memberships

Society for Conservation Biology
Ecological Society of America
American Association for the Advancement of Science
American Institute of Biological Sciences
Society for Ecological Restoration
The Natural Areas Association
Florida Ornithological Society
Florida Native Plant Society
Gopher Tortoise Council

Professional Appointments and Service

2002-present. Member, Florida Forever Work Group, Florida Natural Areas Inventory, Florida State University (Tallahassee, FL)

2002-present. Member, Brevard County Conservation Working Group (Brevard County, FL)

1998-present. Consulting Editor, *Conservation Biology*

2003. Leader, Science Advisory Panel, Mendocino Redwoods Natural Community Conservation Plan and Habitat Conservation Plan (Mendocino County, CA)

2002-2003. Member, Science Advisory Committee, Northeastern U.S. and Maritime Canada Conservation Plan, The Wildlands Project (Burlington, VT)

2002. Leader, Science Advisory Panel, Solano County Natural Community Conservation Plan and Habitat Conservation Plan (Solano County Water Agency, CA)

2002. Leader, Science Advisory Panel, Eastern Merced County Natural Community Conservation Plan and Habitat Conservation Plan (Merced Co., CA)

2001. Leader, Science Review Team, North San Diego County Multi-Species Conservation Plan (San Diego, CA)

2001. Leader, Science Advisory Team, Coachella Valley Multiple Species Habitat Conservation Plan, The Nature Conservancy, U.S. Fish and Wildlife Service, and Coachella Valley Mountains Conservancy, Palm Desert, CA

2000-2002. Chair, Forest Work Group and Member, Design Committee. State of the Nation's Ecosystems project, The H. John Heinz III Center for Science, Economics, and the Environment, Washington, D.C.

1999-2001. President, Society for Conservation Biology

2000-2001. Member, Advisory Panel for Implementation of "High Conservation Value Forests" and "The Precautionary Principle," Forest Stewardship Council, Oaxaca, Mexico

- 1999-2001. Scientific Advisor, Pima County Habitat Conservation Plan, Tucson, AZ
- 1997-1999. Leader. Science Team for Master Plan. Save-the-Redwoods League, San Francisco, CA
- 1998-2000. Leader. Scientific Panel for Review of Material Relevant to the Occurrence, Ecosystem Role, and Tested Management Options for Mountain Goats in Olympic National Park. U.S. Department of Interior
1999. Chair. Kanab Ambersnail Scientific Review Panel. Arizona Department of Game and Fish
- 1992-present. Member, Board of Governors, Society for Conservation Biology
- 1991-1996, 1999, 2000-present. Co-founder and Member of Board of Directors, The Wildlands Project
- 1990-present. Member, State of Oregon Habitat Conservation Trust Fund Board
- 1997-present. Member, Advisory Board, Korea Peace Bioreserves Project
- 1996-present. Science Advisor, World Resources Institute
- 1992-present. Member, Advisory Board, The Ecoforestry Institute
- 1992-present. Member, Scientific Advisory Board, Conservation International
- 1993-present. Member, Advisory Board, Oregon Natural Desert Association
- 1994-present. Member, Science Advisory Board, Defenders of Wildlife
- 1992-2000. Member, Board of Directors, Wild Earth Society
- 1993-1996. Member, Board of Directors, Natural Areas Association
1993. Member, Old-growth Ecosystem Panel for Northwest Forest Ecosystem Team advising President Clinton on forest management options
- 1993-1996. Member, Committee on the Scientific Basis for Ecosystem Management, Ecological Society of America
- 1994-1996. Member, Ad Hoc Committee to Revise Criteria for Selection of Biosphere Reserves, USMAB, U.S. Department of State
- 1991-1994. Member, Southern California Coastal Sage Scrub Scientific Review Panel (appointed by Governor of California)
- 1989-1991. Professional Participant, Keystone Center National Policy Dialogue on Biological Diversity
- 1990-1991. Member, World Wildlife Fund Advisory Committee on Habitat Conservation Plans
- 1989-present. Member, Advisory Board, Northwest Ecosystem Alliance
- 1991-present. Member, Board of Editors, Conservation Biology
- 1988-1993. Subject Matter Editor for Landscape Ecology, Board of Editors, The Natural Areas Journal

1991-present. Science Editor, Wild Earth

1984-present. Peer reviewer for Conservation Biology, Biological Conservation, Ecology, Ecological Applications, Journal of Wildlife Management, The Natural Areas Journal, BioScience, The Environmental Professional, Trends in Ecology and Evolution, Landscape Ecology, Ecography, and others

Courses Taught

School for Field Studies: Field Ecology in San Juan Mountains (co-taught), 1987

University of Florida: Field Techniques in Wildlife Ecology (co-taught), 1988

Santa Fe Community College: General Biology, 1988

U.S. Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, U.S.

National Park Service: many short-courses on biodiversity, endangered species, and ecosystem management (co-taught), 1988-1999

Oregon State University: Seminar in Conservation Biology, 1994

University of Oregon: Conservation Biology, 2000

University of Central Florida: Seminar in Conservation Biology, 2003

Invited Lectures, Seminars, and Presentations

Average of 2-3 monthly since 1990 (i.e., too numerous to list).

Graduate Theses and Dissertations Supervised

1997 Carlos Carroll. Predicting the distribution of the fisher (*Martes pennanti*) in northwestern California, U.S.A. using survey data and GIS modeling. M.S., Department of Fisheries and Wildlife, Oregon State University.

1999 Kenneth W. Vance-Borland. Physical habitat classification for conservation planning in the Klamath Mountains region. M.S., Department of Fisheries and Wildlife, Oregon State University.

2000 Carlos Carroll. Spatial modeling of carnivore distribution and population viability. Ph.D., Department of Forest Science, Oregon State University.

2002 Paul Adamus. Winter habitat relationships of birds in wetlands in the Willamette Valley, Oregon. Ph.D., Department of Fisheries and Wildlife, Oregon State University.

Expected 2003: Robin Bjork. Intratropical migration of the Mealey Parrot (*Amazona farinosa*) in Guatemala: implications for conservation. Ph.D., Department of Fisheries and Wildlife, Oregon State University.

Major (> \$100,000) Grant-Funded Projects Directed as Principal Investigator Since 1995

1995-1999. \$170,000. Conservation Plan for Klamath-Siskiyou Ecoregion. Funders: W. Alton Jones Foundation, David and Lucille Packard Foundation, Foundation for Deep Ecology

1997-2002. \$343,000. Rocky Mountain Carnivores Conservation Assessment. Funders: World Wildlife Fund Canada, The Nature Conservancy, Yellowstone to Yukon Conservation Initiative, Kendall Foundation, Wilburforce Foundation

1999-2001. \$215,000. Conservation Assessment for Greater Yellowstone Ecosystem and Utah-Wyoming Rocky Mountains Ecoregion. Funders: The Nature Conservancy, Greater Yellowstone Coalition, Doris Duke Foundation

Professional References

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- Noss, R.F., J. R. Strittholt, K. Vance-Borland, C. Carroll, and P. Frost. 1999. A conservation plan for the Klamath-Siskiyou ecoregion. Natural Areas Journal 19:392-411.
- Carroll, C., W. J. Zielinski, and R.F. Noss. 1999. Using presence-absence data to build and test spatial habitat models for the fisher in the Klamath region, USA. Conservation Biology 13:1344-1359.
- Main, M.B., F.M. Roka, and R.F. Noss. 1999. Incentive-based conservation on private lands in southwest Florida. Conservation Biology 13:1262-1272.
- DellaSala, D.A., R.F. Noss, and D. Perry. 2000. Applying conservation biology and ecosystem management to federal lands and forest certification. Ecoforestry 15(2):28-39.
- Noss, R.F. 2000. High-risk ecosystems as foci for considering biodiversity and ecological integrity in ecological risk assessments. Environmental Science and Policy 3:321-332.
- Noss, R.F. 2001. Beyond Kyoto: Forest management in a time of rapid climate change. Conservation Biology 15:578-590.
- Carroll, C., R.F. Noss, and P.C. Paquet. 2001. Carnivores as focal species for conservation planning in the Rocky Mountain region. Ecological Applications 11:961-980.
- Andreasen, J.K., R.V. O'Neill, R. Noss, and N.C. Slosser. 2001. Considerations for the development of a terrestrial index of ecological integrity. Ecological Indicators 1:21-35.
- Noss, R.F., C. Carroll, K. Vance-Borland, and G. Wuerthner. 2002. A multicriteria assessment of the irreplaceability and vulnerability of sites in the Greater Yellowstone Ecosystem. Conservation Biology 16:895-908.
- Redford, K.H. P. Coppolillo, E.W. Sanderson, G.A.B. da Fonseca, E. Dinerstein, C. Groves, G. Mace, S. Maginnis, R. Mittermeier, R. Noss, D. Olson, J.G. Robinson, A. Vedder, and M. Wright. 2003. Mapping the conservation landscape. Conservation Biology 17:116-131.
- Carroll, C., R.F. Noss, P.C. Paquet, and N.H. Schumaker. In press. Integrating population viability analysis and reserve selection algorithms into regional conservation plans. Ecological Applications.
- Noss, R.F. 2003. A checklist for wildlands network designs. Conservation Biology 17:xx-xx.
- Noss, R.F. In review. Information needs for large-scale conservation planning. Natural Areas Journal.
- Carroll, C., R.F. Noss, P.C. Paquet, and N.H. Schumaker. In review. Extinction debt of protected areas in developing landscapes. Conservation Biology.

Books

- Noss, R.F., and A. Cooperrider. 1994. Saving Nature's Legacy: Protecting and Restoring Biodiversity. Island Press, Washington, D.C.
- Noss, R.F., M.A. O'Connell, and D.D. Murphy. 1997. The Science of Conservation Planning: Habitat Conservation under the Endangered Species Act. Island Press, Washington, D.C.
- Noss, R.F., editor. 2000. The Redwood Forest: History, Ecology, and Conservation of the Coast Redwoods. Island Press, Washington, D.C.

Thornburgh, D., R. Noss, F. Euphrat, D. Angelides, C. Olson, A. Cooperrider, H. Welsh, and T. Roelofs. 2000. Managing redwoods. Pages 229-261 in R. Noss, ed. The Redwood Forest: History, Ecology, and Conservation of the Coast Redwoods. Island Press, Washington, DC.

Noss, R. 2000. Lessons from the redwoods. Pages 263-268 in R. Noss, ed. The Redwood Forest: History, Ecology, and Conservation of the Coast Redwoods. Island Press, Washington, DC.

Noss, R.F. 2000. Maintaining the ecological integrity of landscapes and ecoregions. Pages 191-208 in D. Pimentel, L. Westra, and R. Noss, editors. Ecological Integrity: Integrating Environment, Conservation, and Health. Island Press, Washington, DC.

Noss, R.F. 2001. Introduction: Why restore large mammals? Pages 1-21 in D. Maehr, R. Noss, and J. Larkin, eds. Large Mammal Restoration: Ecological and Sociological Challenges for the 21st Century. Island Press, Washington, DC.

Carroll, C., R. F. Noss, N. H. Schumaker, and P. C. Paquet. 2001. Is the return of the wolf, wolverine, and grizzly bear to Oregon and California biologically feasible? Pages 25-46 in D. Maehr, R. Noss, and J. Larkin, eds. Large Mammal Restoration: Ecological and Sociological Challenges for the 21st Century. Island Press, Washington, DC.

Noss, R.F. 2002. Aldo Leopold was a conservation biologist. Pages 106-117 in R.L. Knight and S. Riedel, eds. Aldo Leopold and the Ecological Conscience. Oxford University Press, Oxford, UK.

Noss, R.F., and K. Daly. In prep. Incorporating connectivity into broad-scale conservation planning. Chapter in K. Crooks and M. Sanjayan, editors. Maintaining connections for nature: the importance of connectivity for conservation.

Technical Reports and Symposium Proceedings

Noss, R.F. 1981. Birds of Ohio: a Field Checklist. Ohio Department of Natural Resources. 12 pp.

Noss, R.F., H.W. Kale, and C.W. Biggs. 1985. Florida Breeding Bird Atlas: Handbook for Cooperators. Florida Audubon Society, Maitland, Florida. 28 pp.

Noss, R.F. 1985. Landscape Considerations in Reintroducing and Maintaining the Florida Panther: Design of Appropriate Preserve Networks. Report to the Florida Panther Technical Advisory Council. 32 pp. + figures.

Cristoffer, C., R.F. Noss, and J.F. Eisenberg. 1985. Report No. 3. On the captive breeding and reintroduction of the Florida panther into suitable habitats. Report to Florida Game & Fresh Water Fish Commission, Tallahassee, FL.

Harris, L.D., and R.F. Noss. 1987. Endangerment with the best of intentions. Pages 31-38 in R. Fitter and M. Fitter, eds. Proceedings of a Symposium held by the Species Survival Commission, Madrid, 7-9 Nov., 1984. International Union for Conservation of Nature and Natural Resources, Gland, Switz.

Brown, M.T., J.M. Schaefer, K.H. Brandt, S.J. Doherty, C.D. Dove, J.P. Dudley, D.A. Eifler, L.D. Harris, R.F. Noss, and R.W. Wolfe. 1987. An Evaluation of the Applicability of Upland Buffers for the Wetlands of the Wekiva Basin. Center for Wetlands, University of Florida. 163 p.

Duever, L.C., R.W. Simons, R.F. Noss, and J.R. Newman. 1987. Comprehensive Inventory of Natural Ecological Communities in Alachua County. KBN Engineering and Applied Sciences. Gainesville, Florida.

Conservation of *Oxyloma* Snails in Arizona and Utah. Report to Arizona Game and Fish Department. Phoenix, AZ.

Carroll, C., R.F. Noss, and P.C. Paquet. 2000. Carnivores as focal species for conservation planning in the Rocky Mountain region. World Wildlife Fund Canada, Toronto, Ontario.

Noss, R.F., R. Graham, D. R. McCullough, F. L. Ramsey, J. Seavey, C. Whitlock, and M. P. Williams. 2000. Review of Scientific Material Relevant to the Occurrence, Ecosystem Role, and Tested Management Options for Mountain Goats in Olympic National Park. Report to U.S. Department of Interior, Washington, D.C.

Noss, R.F. 2000. Landscape species as conservation tools. Unpublished report. Wildlife Conservation Society, Bronx, New York.

Noss, R.F. 2000. Habitat fragmentation as a cumulative impact of winery expansion and other development in Napa County, California. Unpublished report. Sierra Club, San Francisco, CA.

Franklin, J., D. Perry, R. Noss, D. Montgomery, and C. Frissell. 2000. Simplified forest management to achieve watershed and forest health: a critique. Report of the Scientific Panel on Ecosystem Based Forest Management. National Wildlife Federation, Seattle, WA.

Noss, R.F. 2000. Wilderness biology and conservation: future directions. Pages 52-54 in D.N. Cole, S.F. McCool, W.A. Freimund, and J. O'Loughlin, compilers. Wilderness Science in a Time of Change Conference. Vol. I: Changing Perspectives and Future Directions. Proceedings RMRS-P-15-VOL-1. USDA Forest Service Rocky Mountain Research Station, Ogden, UT.

Noss, R.F. 2001. Biocentric ecological sustainability: A citizen's guide. Biodiversity Legal Foundation, Louisville, CO.

Noss, R., E. Allen, G. Ballmer, J. Diffendorfer, M. Soulé, R. Tracy, and R. Webb. 2001. Independent science advisors' review: Coachella Valley Multiple Species Habitat Conservation Plan (MSHCP/NCCP). Conservation Science, Inc., Corvallis, OR.

Noss, R., P. Beier, D. Faulkner, R. Fisher, B. Foster, T. Griggs, P. Kelly, J. Opdycke, T. Smith, and P. Stine. 2001. Independent science advisors' review: North County Subarea Plan, County of San Diego, Multiple Species Conservation Program. Part I: Review of habitat conservation model, with suggestions for conservation planning principles, species coverage, and adaptive management.

Noss, R.F., G. Wuerthner, K. Vance-Borland, and C. Carroll. 2001. A Biological Conservation Assessment for the Greater Yellowstone Ecosystem: Report to the Greater Yellowstone Coalition. Conservation Science, Inc., Corvallis, OR.

Noss, R.F., G. Wuerthner, K. Vance-Borland, and C. Carroll. 2001. A Biological Conservation Assessment for the Utah-Wyoming Rocky Mountains Ecoregion: Report to The Nature Conservancy. Conservation Science, Inc., Corvallis, OR.

Noss, R., P. Beier, D. Faulkner, R. Fisher, B. Foster, T. Griggs, P. Kelly, J. Opdycke, T. Smith, and P. Stine. 2002. Independent science advisors' review: North County Subarea Plan, County of San Diego, Multiple Species Conservation Program. Part II: Review of Consultants' Response to Part I Report and Revision of Preserve Planning Process. San Diego, CA.

Noss, R.F., K. Bennett, E. Butterworth, A. Couturier, P. Paquet, and K. Vance-Borland. 2002. Conservation Biology for Canada's Boreal Forest. Report to the Pew Foundation and the Canadian Boreal Trust. Conservation Science, Inc. Corvallis, OR.

Carroll, C., R.F. Noss, and P.C. Paquet. 2002. Rocky Mountain Carnivore Project Final Report. Report to World Wildlife Fund Canada. Conservation Science, Inc. Corvallis, OR.

Noss, R., R. Amundson, M. Barbour, R. Bugg, B. Cypher, R. Grosberg, T. Hanes, R. Hansen, B. Pavlik, K. Rice, P. Trenham, B. Shaffer, and B. Weir. 2002. Report of Science Advisors, Eastern Merced County Natural Community Conservation Plan and Habitat Conservation Plan. Part I: General Review of Approach, Methods, and Planning Principles, and Responses to Initial Questions. Merced, CA.

Noss, R., R. Amundson, D. Arnold, M. Bradbury, S. Collinge, B. Grewell, L. McKee, P. Northen, C. Swanson, and R. Yoshiyama. 2002. Report of Science Advisors, Solano County Natural Community Conservation Plan and Habitat Conservation Plan. Vacaville, CA.

Foreman, D., K. Daly, R.F. Noss, M. Clark, K. Menke, D. R. Parsons, R. Howard. 2003. New Mexico Highlands Wildlands Network Vision—Connecting the sky islands to the Southern Rockies. Wildlands Project, Richmond, VT.

Other Articles

Noss, R.F. 1980. Caving for gray bats in Kentucky. The Explorer 22(4): 22-27.

Noss, R.F. 1982. Conservation in and out of nature preserves. Ohio Journal of Science 82: 101.

Noss, R.F. 1983. Birds as preserve management indicators: regional perspective urged. Restoration and Management Notes 1(3): 29.

Noss, R.F. 1983. Re-creating an Ohio Valley wilderness. Midwest Earth Advocate 1(1): 4.

Noss, R.F. 1984. About not knowing everything (Guest Editorial). Restoration and Management Notes 2(1): 3.

Noss, R.F. 1985. Rescue or abuse? The Palmetto 4(4): 12.

Noss, R.F. 1986. Conservation Guidelines: Florida Native Plant Society. The Palmetto 6(2): 12-13.

Noss, R.F. 1986. Dangerous simplifications in conservation biology. Bulletin of the Ecological Society of America 67:278-279.

Noss, R.F. 1987. Do we really want diversity? Whole Earth Review 55: 126-128

Noss, R.F. 1987. Saving species by saving ecosystems: A review of The Preservation of Species: The Value of Biological Diversity, ed. by Brian G. Norton. Conservation Biology 1: 175-177.

Noss, R.F. 1987. Florida's National Forests: Our last chance. ENFO 87(6): 1-14.

Noss, R.F. 1988. The longleaf pine landscape of the Southeast: almost gone and almost forgotten. Endangered Species Update 5 (5): 1-8.

Noss, R.F. 1989. Who will speak for biodiversity? Conservation Biology 3: 102-103.

Noss, R.F., and S. Henderson. 1989. Biodiversity: A new focus for environmental protection. Habitat Futures, Summer 1989: 13-14.

- Noss, R.F. 1989. A history of predator control. Review of Saving America's Wildlife, by T.R. Dunlap. Trends in Ecology and Evolution 4: 358.
- Noss, R.F. 1990. Can we maintain biological and ecological integrity? Conservation Biology 4: 241-243.
- Noss, R.F. 1991. Sustainability and wilderness. Conservation Biology 5: 120-122.
- Noss, R.F. 1991. Review of Wildlife, Forests, and Forestry: Principles of Managing Forests for Biological Diversity, by Malcolm L. Hunter, Jr. Forest Perspectives 1(1): 18.
- Noss, R.F. 1991/92. Biologists, biophiles, and warriors. Wild Earth 1(4): 56-60.
- Brussard, P.F., D.D. Murphy, and R.F. Noss. 1992. Strategy and tactics for conserving biological diversity in the United States. Conservation Biology 6: 157-159.
- Noss, R.F. 1992. The Wildlands Project: Land conservation strategy. Wild Earth (Special Issue): 10-25.
- Foreman, D., J. Davis, D. Johns, R. Noss, and M. Soulé. 1992. The Wildlands Project mission statement. Wild Earth (Special Issue): 3-4.
- Noss, R.F. 1993. Review of Nature Conservation 2: The Role of Corridors, by D.A. Saunders and R.J. Hobbs. Journal of Wildlife Management 57: 191-192.
- Noss, R.F. 1993. Whither conservation biology? Conservation Biology 7: 215-217.
- Murphy, D., D. Wilcove, R. Noss, J. Harte, C. Safina, J. Lubchenco, T. Root, V. Sher, L. Kaufman, M. Bean, and S. Pimm. 1994. On reauthorization of the Endangered Species Act. Conservation Biology 8: 1-3.
- Noss, R.F. 1994. Cows and conservation biology. Conservation Biology 8: 613-616.
- Noss, R.F. 1994/95. Wilderness--Now more than ever (A response to Callicott). Wild Earth 4(4): 60-63.
- Noss, R.F. 1995. Foreword. Pages xiii-xv in L. Hansson, L. Fahrig, and G. Merriam, eds. Mosaic Landscapes and Ecological Processes. IALE Studies in Landscape Ecology 2. Chapman and Hall, New York.
- Noss, R.F. 1995. Foreword. Pages x - x in CREILG Special Project Team. Atlas of the Central Rockies Ecosystem: Toward an Ecologically Sustainable Landscape. Komex International, Ltd., Calgary, Alberta.
- Noss, R.F., and D.D. Murphy. 1995. Species and habitat are inseparable. Conservation Biology 9: 229-231.
- Noss, R.F. 1995. The perils of Pollyannas. Conservation Biology 9: 701-703.
- Noss, R.F. 1995. Assessing rigor and objectivity in conservation science. Wildlife Society Bulletin 23:539-541.
- Noss, R.F. 1995/96. Science grounding strategy: Conservation biology in wildlands work. Wild Earth 5(4): 17-19.
- Noss, R.F. 1995/96. What should endangered ecosystems mean to The Wildlands Project? Wild Earth 5(4): 20-29.

Vance-Borland, K., R. Noss, J. Strittholt, P. Frost, C. Carroll, and R. Nawa. 1995/96. A biodiversity conservation plan for the Klamath/Siskiyou region: A progress report on a case study for bioregional conservation. Wild Earth 5(4): 52-59.

Noss, R.F. 1996. The naturalists are dying off. Conservation Biology 10:1-3.

Noss, R.F. 1996. Do Eastside forests need restoration or crown fires? Wild Earth 6(2):9-11.

Noss, R.F. 1996. Foreword. Pages xi - xii in D.A. Falk, C.I. Millar, and M. Olwell, eds. Restoring Diversity: Strategies for Reintroduction of Endangered Plants. Center for Plant Conservation and Island Press, Washington, DC.

Noss, R.F. 1996. Ecosystems as conservation targets. Trends in Ecology and Evolution 11:351.

Noss, R.F. 1996. Conservation or convenience? Conservation Biology 10:921-922.

Noss, R.F. 1997. Foreword. Pages iii-iv in T.N. Kaye, A. Liston, R.M. Love, D.L. Luoma, R.J. Meinke, and M.V. Wilson, eds. Conservation and Management of Native Plants and Fungi: Proceedings of an Oregon Conference on the Conservation and Management of Native Vascular Plants, Bryophytes, and Fungi. Native Plant Society of Oregon, Corvallis, OR.

Noss, R.F. 1997. Reinterpreting sustainability. Review of Last Stand: Protected Areas and the Defense of Tropical Biodiversity, edited by R. Kramer, C. van Schaik, and J. Johnson. Trends in Ecology and Evolution 12:450-451.

Noss, R.F. 1997. The failure of universities to produce conservation biologists. Conservation Biology 11: 1267-1269.

Noss, R.F. 1998. Does conservation biology need natural history? Wild Earth 8(3):10-14.

Soulé, M., and R. Noss. 1998. Rewilding and biodiversity: complementary goals for continental conservation. Wild Earth 8(3):18-28.

Miller, B., R. Reading, J. Strittholt, C. Carroll, R. Noss, M. Soulé, O. Sanchez, J. Terborgh, D. Brightsmith, T. Cheeseman, and D. Foreman. 1998/99. Using focal species in the design of nature reserve networks. Wild Earth 8(4):81-92.

Noss, R.F. 1999. The President's Column: Dreams of a millennial president. Society for Conservation Biology Newsletter 6(3):1, 7.

Noss, R. 1999/2000. A reserve design for the Klamath-Siskiyou ecoregion. Wild Earth 9(4):71-76.

Noss, R.F. 1999/2000. The warrior naturalists. Defenders 75(1):21.

Noss, R.F. 2000. Three ways to heal the West. Sierra March/April 2000:59.

Noss, R.F. 2000. Science on the bridge. Conservation Biology 14:333-335.

Noss, R.F., and P.B. Beier. 2000. Arguing over little things: A reply to Haddad et al. Conservation Biology 14: 1546-1548.

Noss, R.F. 2001. Review of Carnivores in Ecosystems: The Yellowstone Experience (Clark et al., eds.). Conservation Biology 15:293-294.

Noss, R.F. 2001. Toward a pro-life politics. 2001. Conservation Biology 15:827-828.

Noss, R.F., and R. Kranz. 2001. Ecological issues in conservation: introduction. Ecological Applications 11:945-946.

Noss, R.F. 2001. Review of Forest Fragmentation in the Southern Rocky Mountains (Knight et al., eds.). Landscape Ecology 16:371-372.

Noss, R., and M. Hunter. 2001. From assemblage to community. Conservation Biology 15:1201-1202.

Noss, R.F. 2001. Review of The Historical Ecology Handbook: A Restorationist's Guide to Reference Ecosystems (Egan and Howell, eds.). Ecological Restoration 19:273-274.

Noss, R.F. 2001. Review of Precious Heritage: The Status of Biodiversity in the United States (Stein et al., eds.). Restoration Ecology 9:476-477.

Miller, B., B. Dugelby, D. Foreman, C. Martinez del Rio, R. Noss, M. Phillips, R. Reading, M.E. Soulé, J. Terborgh, and L. Willcox. 2001. The importance of large carnivores to healthy ecosystems. Endangered Species Update 18:202-210.

Noss, R.F. 2001/2002. Citizen scientist or amateur naturalist? Wild Earth 11(3/4):14-17.

Noss, R.F. 2002. Context matters: Considerations for large-scale conservation. Conservation in Practice 3(3):10-19.

Noss, R.F. 2003. Another dead diamondback. Wild Earth 13: xx-xx.

EXHIBIT 11

**Fredrickson, L.H. and Laubhan, M.K., Land Use Impacts
and Habitat Preservation in the Grasslands of Western
Merced County, California (February 1995)**

**LAND USE IMPACTS AND HABITAT PRESERVATION
IN THE GRASSLANDS
OF WESTERN MERCED COUNTY, CALIFORNIA**

Prepared for:

GRASSLAND WATER DISTRICT

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LEIGH H. FREDRICKSON

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February 1995

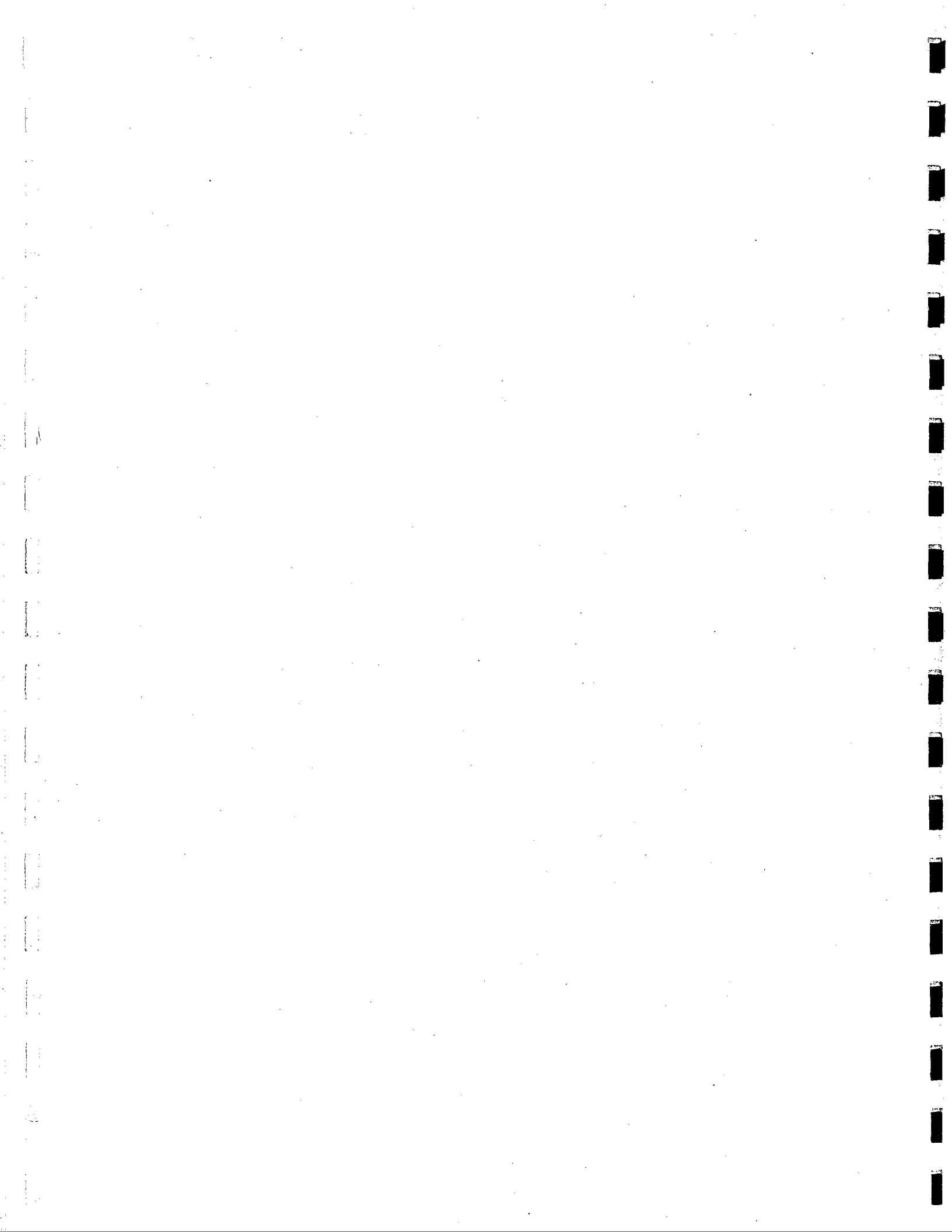


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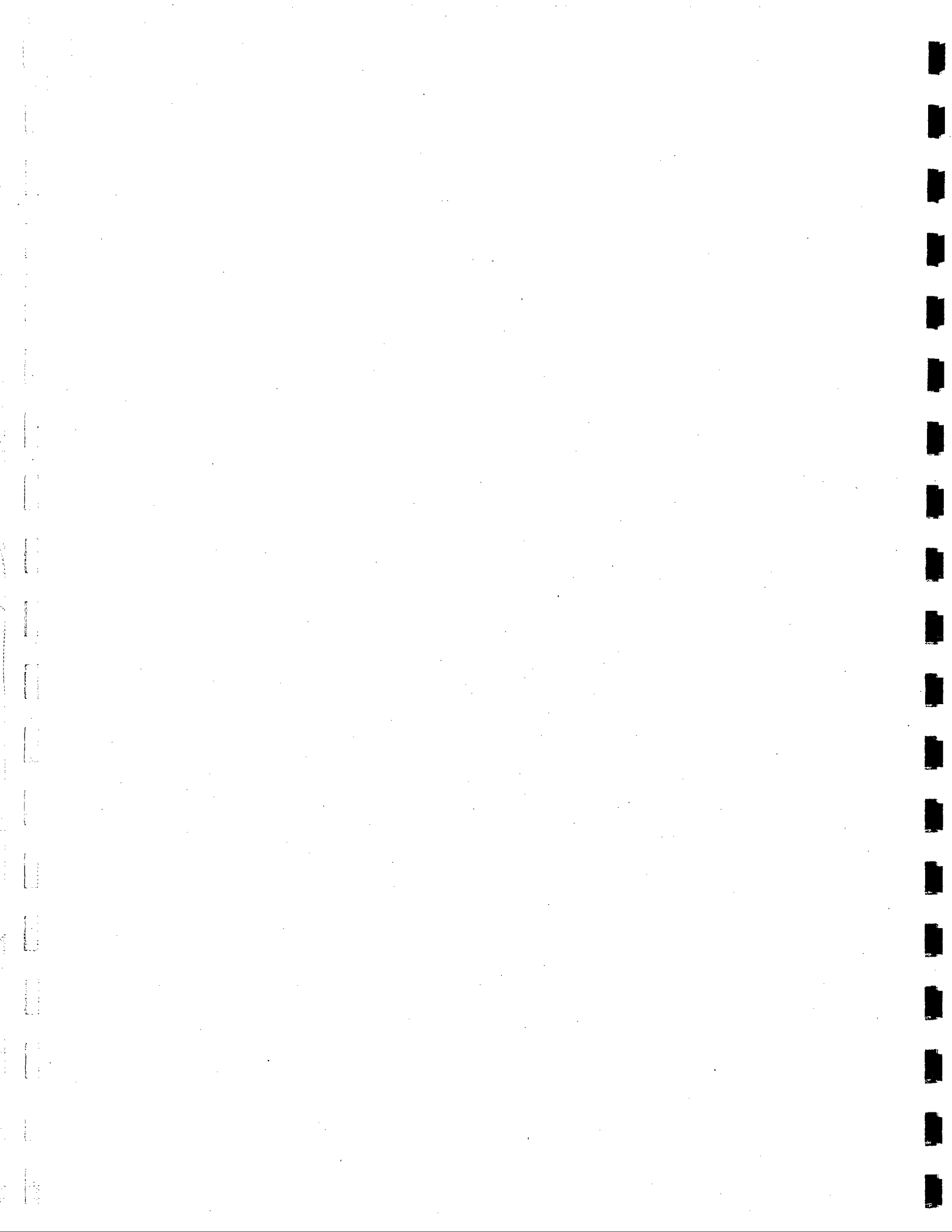
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